Utilisation-Focused Evaluation of ICT in Education: The Case of DFAQ Consultation Space

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ABSTRACT

This paper describes an evaluation of a web-based consultation space (a dynamic frequently asked questions environment - DFAQ) in which learners consult one another using questions, and in which both the flow of interaction and its artefacts become a resource available to a community of learners. The DFAQ is a special form of a Computer-Mediated-Communication tool specifically developed to facilitate question-based interaction. We argue that education is too complex a social structure to be evaluated using deterministic positivist quantitative approaches. Given the volatility of determining what constitutes value, costs, inputs and outputs and the complexity of dynamics of socialization, a non-deterministic qualitative approach, utilisation-focused evaluation approach is used. Our conclusion is that the DFAQ does contribute to students' academic performance and frees the lecturer-learner consultation time.

Keywords

Utilisation-Focused-Evaluation, ICT in Education, Computer-Mediated-Communication, and Dynamic Frequently Asked Questions (DFAQ)

Introduction

To begin with, we ask the following questions - has the use of Information and Communication Technologies (ICT) in education reduced the cost of education? Do ICTs add value to learning? If ICTs reduce the cost of education and add value to learning, then it is worth the investment. With the soaring costs of technological investments for education, proponents of the technology continue claiming that technology does add value to teaching and learning, and argue that the value added is higher than its cost. Linda Harasim, a professor of communication and commentator in the areas of CMC and distance learning, (in Palloff and Pratt 1999:50) report on negative aspect of learning online and student reactions, citing "information overload, communication anxiety in relation to the delayed responses in an asynchronous environment, increased work and responsibility, difficulty in navigating online and following the discussion threads, loss of visual cues, and concerns about health issues related to computer use." Rather than brush off Harasim's experience as an isolated case, it is experiences such as these that bring to question the value claims of using technology in education. We do not use the term *education* in a narrow sense, but use the term as conceptualised by Bowers. Bowers (1987:31) contends that the term education, communication and socialization are one and the same thing and can therefore be used interchangeably. According to Bowers, education involves communication, and therefore socialization, and calls for an acknowledgement of the dual nature of socialization as having the potential to liberate thought and facilitate the communication of new ideas to others; it is also a binding force that may prevent people from seeing how their lives are shaped by social conventions. Accepting Bowers view of education, we are faced with several problems when it comes to evaluating educational technological (ET) interventions. Implied by Bowers is that ET interventions are sandwiched by education, communication and sociological factors, hence becomes a multivariate problem that cannot be evaluated through deterministic isolation of individual variables. Having accepted Bowers' argument it follows that teaching and learning is multicausal and this understanding also implies that the effect of technology is multicausally impacted and has multicausal effect, we call a multicasual duality of technological effect. Suchman (1977:50) observed that in social research we generally deal with multicausal models in which no event has a single cause and each event has multiple effects.

No single factor is a necessary and sufficient cause of any other factor. These logical conditions of "multiplicity of causes" and an "interdependence of events" apply equally to evaluative research. It means that activity A becomes only one of the many possible actions or events, which may bring about (or deter) the desired effect. Furthermore, both activity A and effect B will have many other effects and consequences (Suchman, 1977:50).

Our argument is that most evaluation models of ICT interventions adopt a simplistic approach of causality by failing to acknowledge the complexity of multicausal duality of technological effect. By way of an example, in their recent paper Elissavet and Economides (2003) devised a suitability scale evaluation questionnaire with one hundred and twenty four items each with a five point rating ranging from strongly agree to strongly disagree. Our view is that Elissavet and Economides model is both simplistic and deterministic.

Nygren and Fisher (1998) observe that "assessing costs in the framework of university structures and cultures one must confront several difficult issues". Nygren and Fisher add that "once costs are determined, it still may be difficult to specify what counts as efficiency because of poorly understood pedagogic gains, or because relations between outputs and inputs are highly volatile". We argue that failure to unravel 'what counts as efficiency' is in part attributed to implementation of deterministic 'recipes' of methods based on theories that fails to account for complexities of ET intervention contexts. Bowers (1987:32) cautions that "unless the dynamics of socialization are taken into account, along with culture's pattern for organizing reality, educational theories are likely to be little more than expressions of well intended visions that have little chance of being realized anywhere." Needless to say, both the dynamics of socialization and the culture's pattern for organising reality are important evaluation ingredients and yet are often ignored or missing from evaluation cookbooks.

The volatility of determining what constitutes value, costs, inputs and outputs alluded to by Nygren and Fisher (1998) and the complexity of dynamics of socialization (Bowers 1987) point to the need for non-deterministic qualitative approaches to evaluation. In this project the thinking was to use pragmatic approaches to determining value and premised the study in the utilisation-focused evaluation approach. Utilization-focused evaluation does not advocate any particular evaluation content, model, method, theory, or even use (Patton, 1997:22). Patton (1978:20) argues that real world circumstances are too complex and unique to be routinely approached through the application of isolated pearls of evaluation wisdom. Patton adds that it is like trying to live your life according to Ben Franklin's *Almanac* or any of the full range of proverbial gems that constitute our cultural heritage. Patton (1997:20) postulates that "*Utilization-Focused Evaluation* begin with the premise that evaluations should be judged by their utility and actual use; therefore, evaluators should facilitate the evaluation process and design, noting that everything that is done, from *beginning to end*, will affect use. Nor is 'use' an abstraction. 'Use' concerns how real people in the real world apply evaluation findings and experiences the evaluation process." To the extent that 'real people in the real world' are complex and non-deterministic, naïve evaluation approaches has led to costly evaluation processes leading to voluminous reports that end up gathering dust on shelves with little or no impact on either the object and subject of evaluation process. It is for this reason that Patton (1997:20) argues that the focus in utilization-focused evaluation is on intended use by intended users.

The aim of this evaluation was two fold:

a) To assess whether the use of a Computer Mediated Communication (CMC) tool for student to lecturer, and student-to-student consultation can impact on student academic performance.
b) To assess whether the use a CMC as in a) above "frees up" the lecturer's consultation time.

The research approach employed was action research. This method is ideally suited to the study of technology in its human context (Baskerville and Wood-Harper, 1996). It merges research and practice, resulting in findings that are relevant to the context (Baskerville and Wood-Harper, 1996).

We now describe the cases for which the intervention was developed. In both cases 1 and 2, lecturers setup consultation hours but most students would not use those times and those who did use the time slots, were either the same students with different questions or different students with the same questions. In both cases, the technology became an invaluable tool.

Problem Description

In order to contextualise the research questions, we present two cases that are grounded on empirical evidence and scenarios of three students who are registered in these courses.

Case 1: This case is based on an Information Systems course with 100 registered students. The Lecturer scheduled 2 hours each day for students to come for consultation if they so required. Each consultation was approximately 15 to 30 minutes. Normally, there was no more than one consultation in each session. Consultations were more intense around due dates for deliverables. When deliverables were in groups, consultations were often with the whole group. There were a few students who made regular use of these times,

and a large majority never did. There were also a few that came in outside of consultation times, to ask 'simple' questions, whose answers were either in the course handouts, or on the course website.

The course was made up of a concepts section (worth 55%), a practical section (worth 35%), and a project, which aimed to combine lessons learned from both conceptual and practical sections (10%). The practical section consisted of computer laboratory exercises based on Microsoft Office suite.

The overall mean for the practical section was calculated from the following:

- PC Literacy Test (5%)
- Best 3 Tutorials (15%)
- Web Page Tutorial (5%)
- Practical Exam (10%)

For the concepts (Theory section), the deliverables were as follows:

- Asst 1 (2.5%)
- **** Asst 2 (2.5%)***
- Test 1 (5%)
- Test 2 (5%)
- Final Exam (40%)

* Basis for this project

Case 2: Participants were honours students registered for a degree in Education. Most of these students were full time teachers and studying part time. The lecturer had set aside Monday: 13h30-15h30 and Tuesday: 14h00-15h30 as consultation times. Generally, students did NOT (*lecturer's emphasis*) adhere to these times and "*would interrupt me during office hours!"* end of quote. The lecturer on an average saw 8 of the 20 students during the scheduled consultation time and spent about an hour with each student in total (i.e. 8 hours). She had no record of the number of students that consulted with her outside normal consultation times, as according to her, "*sometimes I will have students seeing me from 8h00-16h00 non stop!*" She went on to say, "*Students will come and ask the same questions all the time and they do not read the times on my door, they do not abide by the students consultation times and this leads to a very inefficient use of my time because I have different students coming and asking the same question.*"

Below we present scenarios of three students registered on these courses. As these cases show, it was not practical for students to see the lecturer during the set consultation times. We show these in order to highlight why we developed the DFAQ consultative space to address the problem. The narrations are reported unedited so as not to dilute their stories.

S1: *"I am a teacher, deputy principal at the school where I am … I do part-time studies which is a bit tough so I come* here *at 4 o'clock, the school ends at 3:30 and I rush through to UCT (University of Cape Town) and get home at about 6:30, 7 o'clock sometimes. … it is difficult to sit together with my fellow students after class because we still have community work to do also*."
Summary: Lecturer's **scheduled consultation times are impractical and access to fellow students difficult.**

S2: *"… with the working* full-*time, with all of us that are working, we need a full-time job, to actually be able to pay your fees to do a degree. So all of us are finishing work at 5, and you don't get to the lecturers. I mean if you look, most people, what, if they finish early, its 4' o'clock. By the time you've got through, realistically, things like traffic, by the time you've actually got there, if you've made concerted effort – I mean, on the days that I did see the lecturer, I've had to dash back and forth. And it was really difficult and I've normally had to cancel something else, you know, it's just a logistical nightmare, and I just felt it wasn't….I mean things like weekends are the, basically the only time that you have to study, because you are working during the week. And then you don't have access you your lecturer anyway; 'because that is the only time that you've actually got.*"
Summary: Lecturer's **scheduled consultation times are impractical and lack of access to the lecturer.**

S3: " *…And I just* feel, *as post-grad students, … if you are paying close to R8000 (approx. US$1050) fees a year, which is a lot of money, we… if you look at the amount of time that I actually spend in class with the lecturer, it's not relative, its' not relative to what we're paying. We should… and it's not fair because we working full-time, that we haven't got access to them (lecturers)."*
Summary: Demand for **more access to the lecturer beyond contact teaching times.**

In view of the above cases and student scenarios we sought to find answers to the following questions:

- Can a lecturer provide individualised help to students at minimum cost to the lecturer in terms of time/effort?
- Is it possible to increase the number of students being helped without each increment of student demanding more time and effort on the part of a lecturer?
- Can student access to a lecturer and fellow students for academic help purposes be maximised without additional costs on part of a student?

Choice of Evaluation Approach

The above evaluation questions were not viewed as cast in stone but were to be revised as the project went by depending on the emerging information in line with the active-reactive-adaptive approach of the *utilisation*-focused paradigm. Patton (1997:135) explained that utilisation-focused evaluators are, first of all, active in deliberately and calculatedly identifying intended users and focusing useful questions. Patton observes that they are reactive in listening to intended users and responding to what they learn about the particular situation in which the evaluation unfolds. They are adaptive in altering the evaluation questions and designs in light of their increased understanding of the situation and changing conditions. Active-reactive-adaptive evaluators don't impose cookbook designs. They don't do the same thing time after time. They are genuinely immersed in the challenges of each new setting and authentically responsive to the intended users of each new evaluation (Pg.135).

In choosing an evaluation method we were mindful of the inadequacies of the scientific approaches to *evaluation*. Elissavet and Economides (2003) in proposing an evaluation instrument for Hypermedia Courseware acknowledges "a piece of hypermedia courseware is socially acceptable, its practical acceptability is examined through the evaluation of content, presentation and organization of the content; technical support and update processes and evaluation of learning." Our argument is that Elissavet and Economides' instrument suffers from determinism and fails to acknowledge the complex learning environment of a hypermedia course. Fisher and Nygren (2000) argues that in a scientific" approach (quasi-experimental design) of carrying out an evaluation, the cost measurements are typically captured by taking apart the constituent activities in teaching a class (with and without the technological intervention), costing out the goods and services entailed, then reconstituting the whole activity in terms of the dollars expended.

The problem with this deterministic approach is that it fails to acknowledge the difficulty of holistically accounting for the *constituent* activities of teaching a class such as strategies of using technology in a classroom to mention but one.

Ehrmann (1995) observed that few educators, evaluators and researcher have paid much attention to *educational* strategies for using technologies. Too often they have been victims of "rapture of technologies." Mesmerized, they focus on individual pieces of software and hardware, individual assignments and, occasionally, to individual courses. Fisher and Nygren (2000) argue that some portion of each of these costs must be calculated in order to understand the cost of delivering a course.

> One should count some portion of the costs of designing, building, loading, or maintaining web-based curricular components as part of the cost of course delivery, just as one would count some portion of classroom usage time (along the lines of paying per square foot multiplied by time used, or amortizing the cost of the physical infrastructure). In the high-tech case, one would measure some fraction of total technology infrastructure costs, per individual class and per course. (Fisher and Nygren, 2000)

In this project we assume Fisher and Nygren's arguments as superficial and academic in nature. We do not calculate the costs of the intervention except to mention that the intervention was web based, hosted on a local server (MEG web server) and therefore bandwidth cost of accessing the site from student labs was insignificant.

Consultation through CMC

Cecez-Kecmanovic and Webb (2000, p310) postulate that Web-based technologies extend the communicative space of learners, and they outline three characteristics of the new extended space that affect learning conditions:
- unrestricted participation in a group activity as long as technical access is available
- permanent recording of learner interactions, including flow of interactions in a period of time
- any-time-any-place access to these records by participants, learners and instructor alike.

A web-based consultative space, a special purpose CMC tool, called the Dynamic Frequently Asked Questions (DFAQ) environment has been developed (Ng'ambi, 2002a). CMC provides a way of sending messages to a group of users, using computers for storage and mediation (Salmon, 2000: 15). The goal of this project is to create a web-based communicative space for learners in which they consult one another using questions, and in which both the flow of interaction and its artefacts become a resource available to a community of learners. Thus, the DFAQ is a web-based interactive consultative space (Ng'ambi, 2002a). Within the DFAQ, each FAQ creates a room or virtual space in which a conversation occurs, may do so or has done so (Ng'ambi, 2002b). We built into the environment some intelligence capable of anticipating the user's future questions and of pre-empting predicted questions through a proactive response (Ng'ambi, 2002c). The DFAQ does not come pre-packaged with questions and responses but the environment is populated with questions and responses as learners ask and respond to each other. Figure 1 shows part of the DFAQ interface.

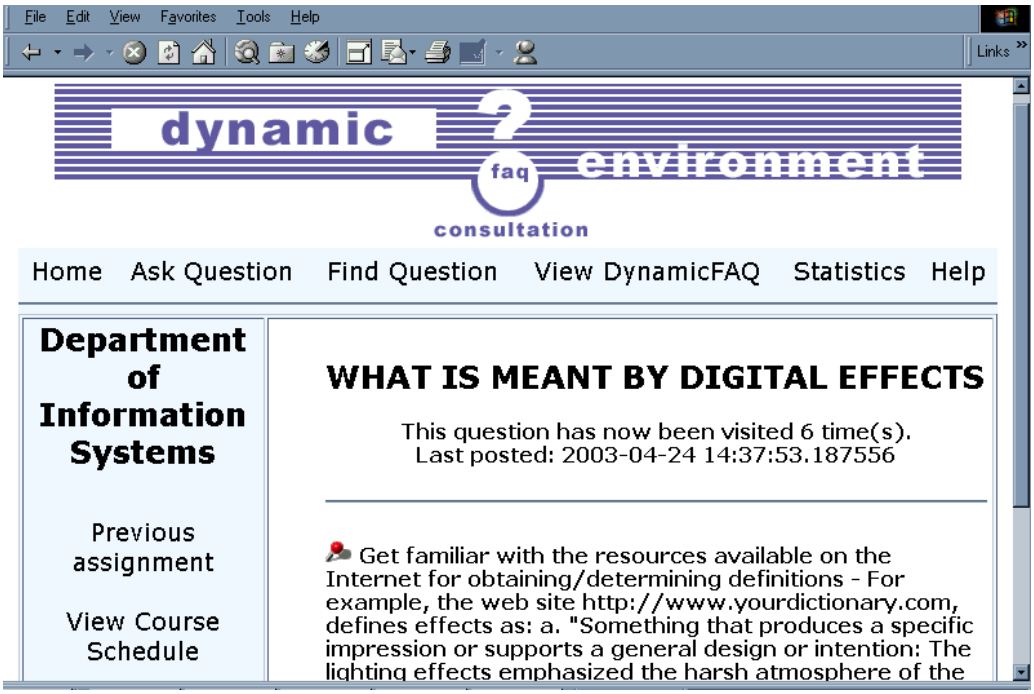

Figure 1: The Dynamic FAQ Environment

Observations

Case 1:

As indicated in the problem description, the DFAQ environment was used specifically for one of the deliverables – Assignment 2, to deal with queries, questions, and clarification of requirements. After an initial introduction to the DFAQ environment, students had access to the facility at any time, and from anywhere. Thus, questions and responses were not only posted during lab sessions.

It was noticed when analyzing the results for the course as a whole that on average Black students had lower marks than other students on most deliverables, whether theoretical or practical. This was attributed to the fact that these students may have had less prior experience with and exposure to information technology than other groups, most likely as a consequence of past apartheid policies that marginalized such students. Being non-technical postgraduates, these contrasts are greater than with undergraduates, who may have benefited from the post-apartheid efforts of bringing redress, for example, through the provision of computers into formerly disadvantaged schools and access to all into formerly advantaged schools.

It was therefore decided to assess the impact of the DFAQ environment on the performance of these students in particular. Results were therefore examined by race, using categories employed by Stats SA (2003) – Black African (B), Coloured (C), White (W) and Indian (I). These categories are still in use in South Africa to monitor progress on issues such as employment equity and various other efforts aimed at reducing the socio-economic disparities created by apartheid..

Since the DFAQ intervention was used with Assignment 2, for the purposes of comparison it was appropriate to compare results with performance on Assignment 1, which was of similar scope, but did not use the DFAQ intervention. Performance on both assignments was assessed using normal formative methods.

Assignment 1 was done in groups of 2 to 3 students, or individually if a student so desired. Students chose their own groups voluntarily. The assignment was based on conceptual work done. ***Questions, queries, and exhaustive explanation of requirements were conducted in a lecture theatre.*** The graph below (Figure 2) depicts the breakdown by race. Black students had the lowest average. It is pertinent to note that the poor performance of Black students in comparison to the class average was consistent in many other deliverables. There is only space here to show one such negative performance.

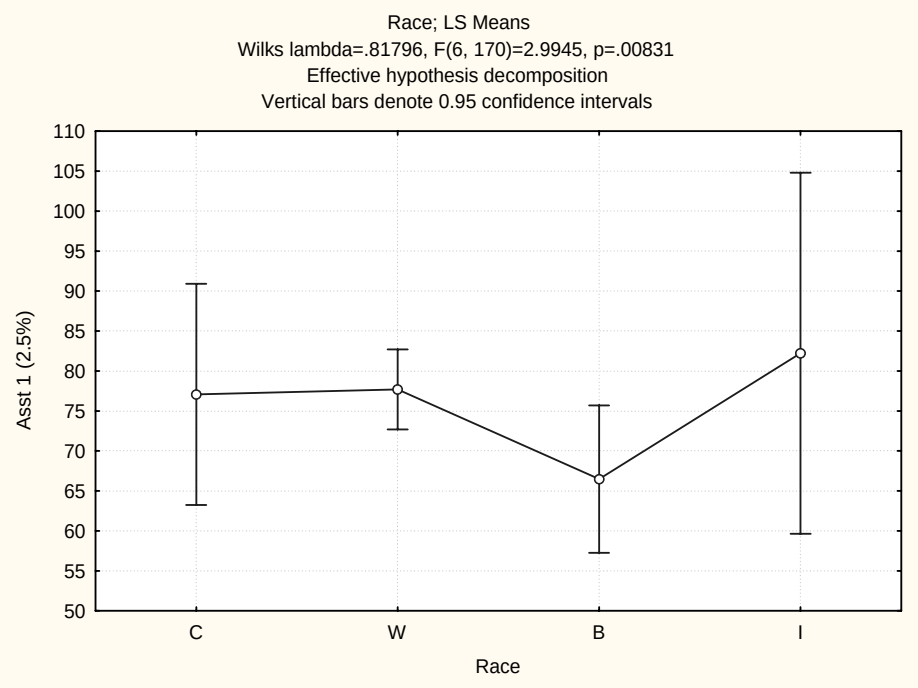

Figure 2: Student Performance before intervention

Assignment 2 was similar to Assignment 1 in that students worked in groups of 2 to 3, or individually if so desired. The assignment focus was also on conceptual work done in the course. Instead of allowing students to ask questions, queries, exhaustive explanation in a face to face session in a lecture theater, students were encouraged to use the ***DFAQ environment to facilitate asking and answering of queries, and for clarifying requirements***.

For the sake of brevity, we show only two typical question-response interactions.

What is Yahoo? Is it a server, search engine or what?

Last posted: 2003-04-24 14:41:08.53617

"Yahoo! is a directory of World Wide Web sites organized in a hierarchy of topic categories. As a directory, it provides both new and seasoned Web users the reassurance of a structured view of hundreds of thousands of Web sites and millions of Web pages. It also provides one of the best ways to search the Web for a given topic. Since Yahoo is associated with the most popular Web search sites, if a search argument doesn't lead to a Yahoo topic page, it will still lead to results from the six or seven popular search engine sites Yahoo links to. Taken from http://whatis.techtarget.com Next time you want to find a definition, visit the whatis.com site. Cheers.

Although some students had heard about “Yahoo”, what the question seen to have done was to allow for some deep reflection on what they thought Yahoo was. What is interesting about the question is that not many

students would have asked it, as it was not related to the assignment at hand. However, the response which was given by a lecturer did not only benefit the author of the question but the rest of the class as well.

What do you mean by the shoot and director

Last posted: 2003-04-24 14:24:32.156205

A shoot is the actual physical recording of a movie. Shoots are most commonly either conducted in studios and/or a real physical location (e.g. the beach or on top of a building). Generally actors act during a shoot, while a cameraman records (a.k.a. shoots - this is where the word comes from). But if a specific scene does not require the actors, a shoot can take place without them. A director does exactly what the name says. He/she directs what happens during the shoot. His/her chief role is to direct the actors. E.g. if they should say a line differently, walk in from a different door, the facial expressions they should have, etc. A director is in general control of the shoot. He/she can, and more often than not, is involved in what happens before and after a shoot (pre- and post-production). In most movie productions, people who are specialists in certain areas (e.g. cinematographers, editors, make-up artists) help to make what the director would like to achieve a reality. People often aren't sure what the difference is between a director and a producer. While a director is purely concerned with the contents of the movie, the producer is concerned with all other issues surrounding the making of the movie. Who should be hired, paying those people, technical staff, feeding the cast and crew, etc. In big productions, organising some of these are conducted by people other than the producer. But ultimately, it is still the producer's responsibility. Hope that clears it up!

The significance of the above example lies in the fact that the response was provided by one of the students. The response is so detailed and clear that none of the students in class remained in doubt as what the differences between the shoot and director was. Our argument is that, if this response was given outside the environment we would have lost an opportunity to learn from the brilliance/experience of a student who responded to the question.

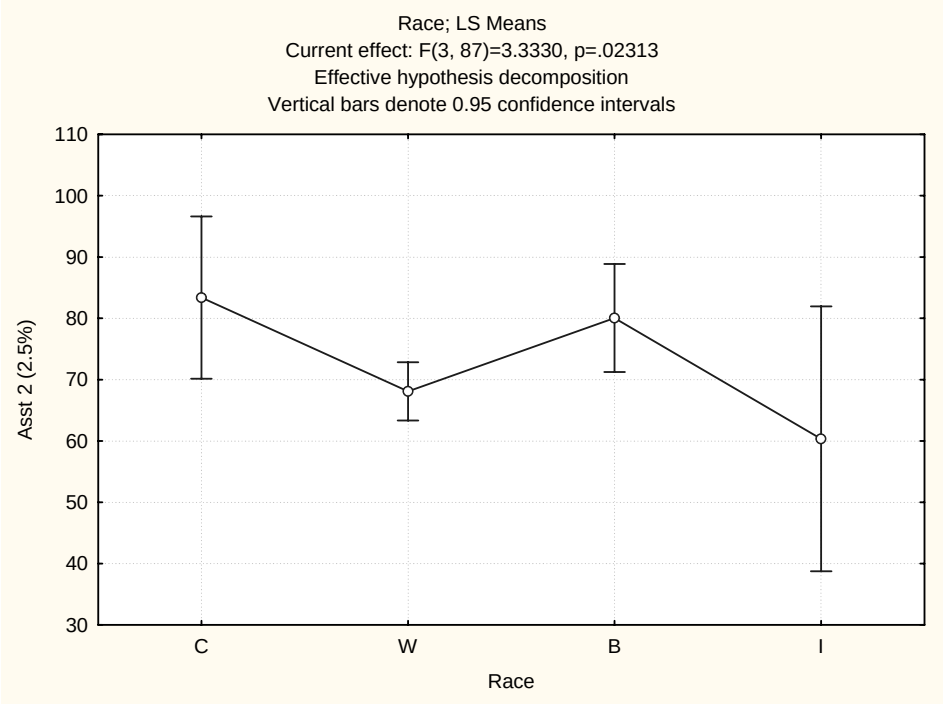

Figure 3: Student Performance after DFAQ intervention

There were 100 questions posted into the environment, an average of a question per student. While the DFAQ environment captures user email addresses, it does not categorize its users in terms of race. The lecturer's knowledge of the group, however, allowed such classification to be quite accurately estimated. Estimates were

that 67% of Black students used DFAQ to post questions; 18% of White students; 25% of Coloured students; and none of the Indian students.

The graph below (Figure 3) shows that Black students for Assignment 2 had the second highest average, after the Coloured group. This *went against all other trends* where Black students had the lowest average.

Consistent with the utilization-focused evaluation, our observation of possible effect of the DFAQ on student performance allowed us to alter the evaluation questions in the light of the 'potential effect on academic performance'. Listening to intended users of the evaluation (lecturers and students), it become clear that they both wanted to know the impact of the DFAQ on student performance while lecturers were also keen to know how much of consultation time was freed up when the DFAQ environment was used for consultation.

Case 2:

Evaluation of Teaching
A total of 157 questions were posted into the environment from 20 students. This is an average of 7.8 questions per student.

The narrations below are extracts from an interview with the lecturers.

Efficiency benefit
"*The fact* that *I could post a response to a question once into the environment that response would be available for everybody who wanted to have known what a particular X is, and I did not need to explain again and again to different students every day. That was the first kind of goal that the DFAQ achieved an efficiency goal. It is not efficient in terms of time when I spent time answering the same question all the time. So do I think it that the DFAQ has been effective, yes, from my perspective as a lecturer it has given me a reservoir of questions. I think, it has freed up my time, let me say that, remarkably I think it has freed up my time."*

Diagnostic benefit
"I had not envisaged that the DFAQ *environment would serve a diagnostic purpose. That was not one of the things I thought it would do. In fact that is one of the things it did particularly well, given that I focussed on questions as indicators of cognitive activities, getting learners to post their questions on-line and being able to see what kind of questions they asked, at a glance was incredibly useful for me diagnostically in many ways. The first way I could tell what learners did not know. Now that seems a simple thing but let me tell you in a class full of people who are from previously disadvantaged background, particularly I have noticed in my class women who are black South Africans do not put up their hand and say, "I want to know X.""*

Student performance benefit
"In the sense of being a space *where learners can go for responses, I think it has worked for the learners. I can't say that it has an impact on their marks. I can say that this group this year (2003) did incrementally better than the group did last year (2002) who did not have access to the sophistication of responses. So I have not controlled the other variables but it is unlikely that students have suddenly become incrementally better than those of last year. It is also unlikely that the class is substantially better than they were last year because it is always pretty much the same kind of people that we face so anecdotally I think we can say that the marks have shifted."*

"*One of the students provided an example of assimilation and accommodation in the DFAQ and his colleagues responded very well to that, they said "Gee that's excellent – brilliant example" while we were in the lab and in his exam he produced that same example and he got 80% for that question. Yes, he ended up getting a first-class pass for the year and this is someone who would be classified as traditionally disadvantaged student, so that is anecdotal evidence but I doubt he would have produced that answer in the exam had he not been validated in the class."*

Confidence and self-esteem benefit
"Most of the women in my class who are from disadvantaged backgrounds will not ask questions in class, they won't put themselves out on the line to be ridiculed by the class, although the class does not actually ridicule you if you ask a question, they won't do it. Years of experience has taught them that when you ask a question you

open yourself to criticism. In an on-line anonymous environment asked whatever they wanted and if you look at their questions you get a sense that they really did ask whatever they wanted because some of the questions, let's face it, are bizarre, I mean they are really very odd, totally out of this world. Now if they had been worried about being regulated, if they had been worried about a kind of a normative discourse, if they had been worried about people looking at them they would not have asked those kinds of questions, they would not have asked anything, but they did ask, so I think that the use of an environment that is anonymous may have had some impact. For some reason it motivates and motivates them to ask questions and to pose responses which they would not do in a class for sure and they would not even do it if I gave them a paper and pencil. They would be quite reticent."

Evaluation of Learning

The following extracts (unedited) are the students' evaluation of the DFAQ environment.

"Value for money" benefit

"Every time I login there's something different; there's more questions; there's stuff that's being answered. So I constantly have to take cognisance. I can't login to it and that's it, stops there. Each time I login there's something different, so I constantly had to rethink and re-look and build and accelerate. And that, to me, was the biggest thing that I felt really strongly about. So that's why I say, "accelerated learning", 'cause you're constantly learning. And you can't get that; and I think that one should, if you're paying university fees, I think, you know. As opposed to having, only growing when you're with the lecturer once a week, you know. For the first time it actually felt like I was doing a course that I didn't mind paying for, because I really got my money's worth out of it."

Academic performance benefit

"I personally feel that, I mean, with working full-time, and just reading, basically, that, um, the site played a very big part in being able to get marks in the 70's, at the end of it, even though I didn't have the most enormous amount of time. Because I could actually [cognitively?] shift on, and I could actually feel it happening. For the first time now I am, and I could actually show them that I could… um, and I've never been like the all-'round A-student, but I could actually say that I with not a lot of academic background, could, um, register for a course that I had no background on, and it's an Honours course – I've never done education or psychology – and get 73%, there's got to be a reason. Something about that course, to pull a student onto that level of understanding – I mean it's not an amazing mark, but to… d'you know what I mean? – With no background, there's got to be…"

Unexpected "Mirrored" benefit

Student 1: "Whereas, with this, you could actually, for me, one of my biggest learning curves was, um, looking at other people's questions. A lot of mine were answered by looking at how other people think. 'Cause you immediately get things mirrored. Often you'll be doing it yourself, but you can't see it until you see someone else doing it."

Student 2: "I did not agree with many of them until I went to read up again and realized that this is what it should be but I did not post my response again to those questions… it is going to make assignments and whatever much more easily for other students than for us that started with the environment."

Student 3: "…the more you read other students' questions, the more you're changing, 'cause you're constantly having to… it's that thing I said the Rubix Cube, where you're constantly having to look at it in different ways."

Cost saving benefit

"I don't necessarily need to have a lecturer one-on-one. I mean, if we could have a DFAQ site, that we engaged in, and then when you got stuck, and you've actually worked through it, you could actually go to a lecturer and say, "okay, this is what I've done," and then, you know, really go with problems, as opposed to questions that you could maybe have answered on the site, or that you can maybe have sorted out by looking through other people's questions. You know, it would be saving the University and ourselves a lot of money; you know, it just seems so much more efficient, and it seems like such a logical way of doing it. That's why I'm saying it's so ironic that there's this Global Village, that the world's getting smaller, but we don't seem to be doing it, you know? We don't seem to be applying it, you know, as well as we could."

Efficiency benefit

"You could actually teach more, a lot more efficiently, and the kids would be getting a lot more out of it. 'Cause that's the big thing, is in a class of 25 you've got a class average, you know? Where you go at the pace of the average; the stronger ones pull and the weaker ones hold back, and in-between is kind-of the way you progress.

I mean this way kids would be able to progress and cognitively grow at their own pace, which would be amazing. And it's been an amazing course to me and my key would be… keyword would be, um, for the first time is accelerated learning. I really felt that, um, I could learn when I needed to. I'm going to find it very difficult to attend any course after this, if we don't have this (DFAQ), because it just seems unfair. You know what I mean? It just seems like you start on a back foot. You know?"

Discussion

Can a lecturer provide *individualised* help to students at minimum cost to the lecturer in terms of time/effort?
Each question posted in the DFAQ environment was responded at an individual level and this meant that the student who *asked* the question received an individualised help. As the figures below show, if the questions asked in the environment each represented a physical consultation with the lecturer, the number of hours required to provide individualised help would increase with each question. However, it would appear the time and effort required on the part of the lecturer to respond to questions was minimal or did not increase with consultation.

Case 1:
Consultation hours = 2hrs/day X 5 days = 10 hrs/week
1X consultation = 30 minutes (worst case) = ½ hour
Assume 100 questions posted = 100 consultations
Then: 100 consultation = ½ hrs X 100 = 50 hours
If all consultation slots were used (Mon, Tue, Wed, Thu, Fri) and each consultation took 30minutes it will take 50 hours (i.e. 5 weeks of consulting with students everyday).

Case 2:
Consultation hours = 2hrs (Mon) + 1 ½ hr (Tue) = 3 ½ hrs/week
1X consultation = 30 minutes = ½ hour
Assume 157 questions posted = 157 consultations
Then: 157 consultation = ½ hrs X 157 = 78½ hours
If all consultation slots were used (Mon, Tue) and each consultation took 30 minutes it will take 78½ hours (i.e. 22 weeks of consulting with students everyday).

Although these calculations are hypothetical in that not all questions take the same amount to respond to, what we are attempting to show is that is face-to-face consultations with students can be time consuming. Palloff and Pratt (1999: 54) recommend the use of online office hours. Palloff and Pratt report on an instructor Seinfeld who notified students that she would be checking the course site every few minutes on Monday evenings from 09:00 P.M. until 10:00 P.M. and on Thursday evenings from 09:00 P.M until 09:30 P.M. It was observed that all students began watching Seinfeld, checking the course site, interacting with the instructor and also with each other, and posting questions for the instructor. Palloff and Pratt postulate those online office hours not only serves to create an opportunity to get questions and answered by the instructor and serve as her office hours but also deepens the sense of community developing within the group (pg. 55).

Is it possible to increase the number of students being helped without each increment of student demanding more time and effort on the part of a lecturer?
Given, that both the question and response were made available "public" for all students to see and also to respond, the question and response tended to be of benefit to a lot more students. There are two possible ways that this approach could have been of help; a) students thoughts got "mirrored" as they saw questions asked by their colleagues b) Benefited from the questions they never thought about before. Palloff and Pratt (1999: 82) contend that in an online environment, learners are expected to view problems and questions from a number of perspectives, including the perspectives of other learners involved in the process.

> Learners are expected to question the assumptions presented by the instructor and those of the other students, as well as their own assumptions and ideas. In so doing, learners in the online classroom are constructing new forms of knowledge and meaning. By engaging in the learning process in this way, learners are learning about learning as well as gaining research and critical thinking skills (Palloff and Pratt, 1999: 82)

Can student access to a lecturer and fellow students for academic help purposes be maximised without additional costs on part of a student?

As reported in the student perspective section, students did not have to see the lecturer face-to-face, time and space restrictions were no longer valid. The fact that students were able to know what fellow students were asking and struggling with, there was access to fellow students. As indicated from the student interviews, there was access to the lecturer such that it made it worth while paying for the course. There were no additional costs incurred by students to access the lecturer or fellow students.

Conclusion

While the project attempted to answer the research questions, there are several new questions that we now ask as a result of this project, questions we could not have asked before. As we conclude this report, we pose these questions as they inform our future work on the project:

a) What caused the Black students in Case 1 to perform exceptionally well after using the DFAQ environment? To what extent can we attribute this performance to the DFAQ? These questions are asked because if we can understand what caused or influenced that performance, it is both in our interest and that of students to encourage that factor to sustain performance.

b) We had observed some incremental improvement in Case 2 class of 2003 over the 2002. Student interviews confirmed that some students performed well and attributed this to the DFAQ. The impact of the DFAQ on academic performance was consequential in that it was not our research question. It goes without saying that, we do not understand how the DFAQ impacts on performance. It is therefore important for us to ask the following question: If improved performance is to some extent attributed to the DFAQ, then how is the DFAQ impacting learning?

c) Empirical evidence from this project postulates that the DFAQ saves the lecturer time and effort in providing individualised consultation to students. However, time and effort saved is of no value unless it is deployed for some good use. Therefore, it is pertinent to ask what lecturers do with the time that is saved from consultation. To what extent is the saved time used for the benefit of students?

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